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ABSTRACT

This report presents an overview of the status of programs of health professions education in Illinois and reviews the policies related to these programs that were adopted by the Board of Higher Education in the early 1980s. Specific questions addressed are as follows: (1) Are the number, type, and distribution of health professions programs appropriate for the demands of Illinois healthcare? (2) Are the numbers of graduates from health professions programs adequate to meet the employment demands in Illinois, or will Illinois be able to meet future need with its current educational capacity?; and (3) What is the status of participation by underrepresented groups in the health professions, and has there been progress in increasing minority representation in health professions education? The report is divided into two parts. Part 1 provides background information and discusses health education policies, current trends in health education, and health care issues. Part 2 focuses on trends in enrollment and degrees granted and lists occupational demands in 10 specific medical health professions: dental, podiatric, optometric, chiropractic, veterinary, pharmacy, nursing, health services administration, public health, and the allied health professions. Appendices present Illinois' policies on health professions education and statistical tables. (Contains 16 references.) (GLR)

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STATE OF ILLINOIS
BOARD OF HIGHER EDUCATION1992 ASSESSMENT OF THE EDUCATIONAL NEEDS
IN HEALTH PROFESSIONS PROGRAMS

This report presents an overview of the status of health professions education in Illinois and a review of the policies related to health programs that were adopted by the Board of Higher Education in the early 1980s. The purpose of this report is to analyze the health educational needs of the state within the context of the healthcare needs of Illinois citizens. In light of the Priorities, Quality, and Productivity Initiative of the Board of Higher Education, health professions education is being analyzed so that adjustments in the current capacity can be made to reflect the priorities of higher education in Illinois and occupational demands. Specific questions to be addressed are:

- Are the number, type and distribution of health professions programs appropriate for the demands of Illinois healthcare?
- Are the numbers of graduates from health professions programs adequate to meet the employment demands in Illinois? Will Illinois be able to meet future need with its current educational capacity?
- What is the status of participation by underrepresented groups in the health professions? Has there been progress in increasing minority representation in health professions education?

The report is divided into two parts. The first part, background information, discusses policies on health education, current trends in health education, and healthcare issues. The second part focuses on trends in enrollment and degrees granted and occupational demands in 10 specific health professions--medicine, dental medicine, podiatric medicine, optometric medicine, chiropractic medicine, veterinary medicine, pharmacy, nursing, health services administration, public health, and the allied health professions.

BackgroundHealth Education Policies

The 1964 *Master Plan for Higher Education in Illinois* recommended a comprehensive study of programmatic needs in the health professions. A Health Education Council was established to study the education needs of the health professions. The recommendations of this group resulted in the report, *Education in the Health Fields for the State of Illinois, 1968*. Because of critical shortages of health personnel at that time, the recommendations included expansion of educational programs in both the private and public sectors of health education. Subsequently, the University of Illinois established medical school branches in Urbana, Rockford, and Peoria, while Southern Illinois University at Carbondale established a School of Medicine in Springfield. Dental education also became available downstate with the establishment of the School of Dentistry at Southern Illinois University at Edwardsville. The enactment of the Health Services Education Grants Act in 1970 authorized the Board to make grants to nonpublic institutions for Illinois residents enrolled in health education programs and to hospitals affiliated with public medical schools for residency training.

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The Baccalaureate Assistance Law for Registered Nurses, enacted in 1973, provided financial incentives for registered nurses to further their education. In 1977, the Family Practice Residency Program Act and Dental Student Grant Act were also initiated to provide scholarships for physicians and dentists to practice in designated shortage areas. Administered by the Illinois Department of Public Health in cooperation with the Board of Higher Education, these grant programs are funded through higher education appropriations. The Dental Student Grants Act was repealed in 1988, and the Baccalaureate Assistance Law for Registered Nurses was not funded for fiscal year 1993.

In 1979, the Illinois Board of Higher Education assessed the Master Plan recommendations for health education in Illinois. At that time, questions focused on expansion in educational programs for the health professions since 1968; access and adequacy of educational programs in the health professions, especially for minorities; and the extent to which state expenditures for educational programs in the health professions had increased and whether increases should continue.

In November 1981, the Board concluded that further expansion of health education programs was not needed. Veterinary medicine and medical school enrollments were to be limited to 1980 entering class levels, and no new programs in allied health or associate and baccalaureate degree programs in nursing were to be approved unless a compelling need was demonstrated. Continued expansion of master's and doctoral nursing programs was recommended, however. The Board reaffirmed the goal to achieve minority enrollment that corresponds to the proportion of the population in the area served by institutions with health programs. Board recommendations in 1981 also called for the review of problems related to transfer of credit from associate degree and diploma programs to baccalaureate degree programs in nursing. The Board also recommended that baccalaureate completion programs be expanded to provide opportunities for associate and diploma nursing graduates to pursue bachelor's degrees.

Two committees were appointed by the Board in 1981 to study specific issues in medicine and dentistry. The medical education special committee examined ways to improve retention of medical school graduates for practice in Illinois. The dental education committee reviewed statewide capacity for dental education, alternatives to regionalization of dental education, retention of dental school graduates, and the economic and educational justification for the dental school at Southern Illinois University at Edwardsville. The findings of these committees resulted in additional policies regarding health professions that were adopted by the Illinois Board of Higher Education in September 1982. These policies called for reduction in dental school enrollments to below 1981 levels, continued support of the School of Dentistry at Southern Illinois University at Edwardsville, the expansion of the Illinois Department of Public Health medical scholarship program to promote practice in medically underserved areas of the state, and the continued monitoring of minority enrollments in medical education. The current policies on education for the health professions are presented in Appendix A.

Trends in Health Education

The U.S. Department of Health and Human Services reported in 1990 that despite the slowed growth in degrees granted in the health professions in the late 1980s, ratios of active health professionals to population were at record highs. Practitioner to population ratios provide a gross measure of supply and have been used in the past to determine overall adequacy in number of practitioners. In Illinois, the practitioner to population ratios have increased in the last decade, and 1990 ratios for dentists, podiatrists, optometrists, pharmacists, nurses, and allied health professionals are higher than national averages. The practitioner to population ratios for physicians and veterinarians in Illinois, however, are slightly below the national average for these professions, and the ratio for chiropractors is the same as the national average.

The Department of Health and Human Service's report also noted the decline nationally in applications to educational programs in most health fields since 1980, with the largest decline, 44 percent, observed in dental school applications. Enrollments in many of the health disciplines also

decreased in the 1980s, again with the largest decline in dentistry. The downward trend in medical and nursing school enrollments reversed by the late 1980s, increasing by four percent each in 1988. Female enrollments in many health professions rose during the 1980s. By 1988, 25 percent of total enrollment nationally in all health professions were female. As in allied health and nursing, women now comprise the majority of enrollments in the professions of pharmacy and veterinary medicine. Minority enrollments in selected health professions have improved nationally since 1980, although Black enrollments have increased much less than enrollment of other minority groups.

Table 1 compares the number of degrees granted in health professions in Illinois to the total number of degrees granted by both public and private institutions. The total number of graduates from all health related programs increased about five percent, from 10,816 in fiscal year 1981 to 11,308 in 1990, compared with an increase of 12 percent in all degrees awarded. Significant increases in master's and doctoral degrees in the health professions have offset declines at other levels.

Healthcare Issues

The U.S. Surgeon General published a set of goals and objectives in 1979 to reduce preventable deaths and injuries by 1990. Only half of these objectives had been met in 1990, while additional health concerns and challenges faced the nation. The Year 2000 National Health Objectives developed by the U.S. Public Health Service and Institute of Medicine, in 1987, support three broad goals for all Americans: 1) to increase the span of healthy life, 2) to reduce health disparities among ethnic and racial groups, and 3) to achieve access to preventive medical services.

While cancer, heart disease, stroke, and accidents continue to be major health issues, the Department of Health and Human Services has identified five emerging health issues that support the national health objectives and that impact on the education of health professionals. These include: the changing demographics and increasingly older population, high infant mortality rates and maternal healthcare issues, acquired immunodeficiency syndrome (AIDS) and substance abuse, reduced access to health care, and the changing delivery systems and quality assurance in professional practice.

The Illinois Department of Public Health is working with local health agencies to establish local health priorities in the context of the Year 2000 National Health Objectives. The Department has identified state priorities and objectives in maternal and child health care, minority health, health promotion, long-term care regulation, and Human Immunodeficiency Virus Disease (HIV)/AIDS. Project Health, a collaborative effort among Illinois public health professionals to identify and implement programs, has been established.

In January 1990, the Illinois Department of Public Health initiated the Minority Health Project to identify program deficiencies and barriers to addressing minority healthcare needs. As the changing demographics impact on healthcare needs, there is also a growing need for higher education to respond to address minority underrepresentation in the health professions and high rates of health problems among minorities.

Nationally, the growth in the elderly population, now 13 percent of the total population, has resulted in those 65 years of age and older becoming the largest healthcare users, and this growth is expected to continue into the twenty-first century. By the year 2020, 17 percent of the population is projected to be over the age of 65 and two percent over the age of 85, both significant increases. Analysis of the percentage of population over 65 among regions in Illinois shows variability in healthcare needs for different areas of the state. The proportion of the elderly population in Chicago and the surrounding metropolitan area is currently significantly lower than other areas of the state, particularly central and southern Illinois, where the average percentage of the population over 65 is above 17 percent compared with the state average of 12.3 percent.

Table 1

TOTAL DEGREES GRANTED BY
ILLINOIS PUBLIC AND PRIVATE COLLEGES AND UNIVERSITIES
IN THE HEALTH PROFESSIONS
AND ALL OTHER FIELDS OF STUDY
(1980-1990)

	<u>1980-1981</u>	<u>1989-1990</u>	<u>Percent Change</u>
<u>Associate Degree</u>			
All Health Professions	2,875	2,667	-8.7%
Total All Degrees	21,411	23,660	10.5%
<u>Certificate (1-4)</u>			
All Health Professions	2,112	2,614	23.8%
Total All Degrees	11,349	11,720	3.3%
<u>Bachelor's Degree</u>			
All Health Professions	2,812	2,683	-9.8%
Total All Degrees	44,487	49,863	12.1%
<u>Master's Degree</u>			
All Health Professions	875	1,140	35.3%
Total All Degrees	16,438	19,756	20.2%
<u>First Professional Degree</u>			
All Health Professions	2,109	2,132	1.1%
Total All Degrees	4,490	4,452	-0.8%
<u>Doctoral Degree</u>			
All Health Professions	33	72	71.4%
Total All Degrees	2,073	2,408	16.2%
Total All Health Professions	10,816	11,308	4.5%
Total All Degrees	100,248	111,860	11.6%

Source: Fall Degrees Granted Reports

Substance abuse will continue to present major challenges with serious implications for healthcare resources. The role of health professionals has expanded in diagnosis, prevention, and treatment of illnesses related to substance abuse. The recognition of the psychological and sociological aspects of these diseases has led to changes in health professions education curricula and increased continuing education for practicing health professionals.

By 1990, almost 148,000 cases of AIDS had been reported nationwide with the number of new cases leveling off at approximately 33,000 per year. A total of 6,782 AIDS cases has been diagnosed in Illinois with 71 percent of these in the City of Chicago and over 80 percent in the greater Chicago area. The wider range of medical care and social services necessary to treat these patients requires health personnel to have specialized knowledge and skills.

Infant mortality rates in Illinois have improved from 14.7 deaths per thousand live births in 1980 to 10.7 in 1990, yet the rate still remains above both the national average and the U.S. health goal of nine deaths per thousand live births. Infant mortality rates for Blacks are twice that of Whites, and Black women are less likely to have prenatal care and more likely to have babies with low birth weights. Lowering the infant death rate is dependent upon improving obstetrical care, especially for Black women, as well as improving those factors that influence infant birth weight. Providing adequate pre- through postnatal care in inner city and rural areas appears essential in addressing this issue. In addition, enhanced utilization of mid-level practitioners such as physician assistants, nurse midwives and nurse practitioners can increase access to health care for women and children. Higher education should respond to this need through education of more mid-level practitioners and primary care specialists and support for alternative healthcare providers.

Changes in payment and reimbursement for medical services will directly affect the delivery of services. In a recent study by Arthur Anderson and the American College of Healthcare Executives, the consensus opinion of a panel of healthcare industry professionals was that managed care organizations and group practices will significantly increase and that more high-cost procedures will shift to physicians' offices. The curriculum for training health personnel will need to respond to these changes and others, such as cost containment and technological advancements, in order to prepare students to deal more effectively with the escalating cost of healthcare, as well as issues of healthcare access.

Regional Health Care

In the past, policies promoting regionalization of healthcare facilities and educational programming were considered prime mechanisms to improve access to health care. Regionalization as a concept involves all health professions, although it is applied primarily to medical education. In Illinois, regionalization of undergraduate medical education, medical residency programs, and dental programs have been the focus of promoting practice throughout Illinois. Colleges and universities across the state offer allied health and nursing programs that serve regional needs.

Currently, there are 55 communities in 23 counties in the state designated as shortage areas for primary care medical specialties. Thirty-seven of these areas have no physician or fewer than one physician per five thousand population. Four counties, Putnam, Scott, Edwards, and Pulaski, had only one licensed physician in 1990. An additional 12 counties had five physicians or fewer practicing in 1990. Nearly 17 percent of Illinois' population resides in these Health Manpower Shortage Areas. Since 1985, Illinois has ranked third highest among the states in the percentage of population residing in designated shortage areas.

Figure 1 displays the projected percent change in all jobs in the healthcare industry by hospital region in Illinois. Compared with the state average of 12.78 percent projected growth for all industries between 1988 and 2000, the growth in the healthcare industry will vary across the state, ranging from slightly above average at 16.7 percent in west central Illinois to a high of 32.9 percent in the northeast part of the state.

Table 2 presents the projected employment changes within the healthcare industry in Illinois. The healthcare industry ranks second among the top 20 industries in the projected number of new jobs in Illinois between 1988 and 2000. Of the total industry employment growth of over 670,000 new jobs, 96,000 are projected to be in health services. The hospital areas that comprise Chicago and the collar counties account for about 72 percent of expected new jobs in the healthcare industry, and largest number of new jobs in this area are expected to be in hospitals. In contrast, nursing and personal care facilities are projected to have the greater number of new jobs in the rest of the state, corresponding to their relatively larger elderly population. Of the approximately 96,000 projected new jobs in healthcare between 1988 and 2000, almost 28 percent will be in the hospital sector, 25 percent in nursing and personal care facilities, 18 percent in offices of physicians, 10 percent in home health, and the remaining 19 percent in offices and laboratories of other health practitioners and private industry. Employment in home health care is expected to have the fastest rate of growth across the state.

The federal government enacted legislation in both 1978 and 1985 to provide funding and support to establish rural health clinics to recruit physicians and nurses to rural areas. In 1989, the Illinois General Assembly passed legislation creating the Center for Rural Health, administered by the Illinois Department of Public Health. The Center provided technical assistance to 22 rural communities in fiscal years 1989 and 1990 to establish rural health clinics. Federal regulations require, however, that each rural health clinic be staffed by a nurse practitioner or physician assistant, both of which are health professions with shortages. The federal government has also utilized Area Health Education Centers (AHEC), the National Health Service Corps, and Health Education and Training Centers to improve the number of health professionals in underserved areas. Recently, the Chicago College of Osteopathic Medicine received approval to develop an AHEC for Illinois, although its activity is currently limited to underserved areas in the Chicago metropolitan area.

Education for the Health Professions

In the 1981 Board of Higher Education report, *An Assessment of Progress Since 1968 In Education For The Health Professions*, medical, dental, podiatric, optometric, allied health, nursing, pharmacy, public health, and veterinary medical education were studied. For this report, the same professions are evaluated, except that health services administration is reviewed with public health and chiropractic education is presented with a group of other medical education programs (optometry, podiatry, veterinary medicine), each of which is offered by a single institution. Tables in Appendix B provide an overview of statewide patterns and trends in the health professions. Following is a brief discussion of each of these tables.

The number and type of programs by profession are listed in Table B-1 in Appendix B. More than 700 health professions programs are available at Illinois colleges and universities, with about 31 percent offered by private institutions, 13 percent by public universities, and 56 percent provided by community colleges. All of the community college health programs are in the fields of allied health and nursing.

Table B-2 compares degrees granted in fiscal years 1981 and 1990 for specific health professions. The total number of graduates in the health professions increased 4.5 percent over the decade. The number of first-professional degrees remained relatively stable at slightly more than 2,100 degrees granted each year. The greatest increase was at graduate level, in which there was more than a 100 percent increase in the number of doctoral degrees and a 30 percent increase in master's degrees granted between fiscal years 1981 and 1990. The number of certificates granted between 1981 and 1990 rose 24 percent, while the number of baccalaureate degrees decreased about five percent, and the number of associate degrees decreased seven percent. Declines in the number of degrees granted were notable in dental medicine, podiatry, and pharmacy. Health services administration was the only field with significant increases in the number of degrees awarded.

FIGURE 1

PROJECTED TOTAL PERCENT CHANGE IN EMPLOYMENT
IN HEALTHCARE INDUSTRIES
BY ILLINOIS HOSPITAL AREA

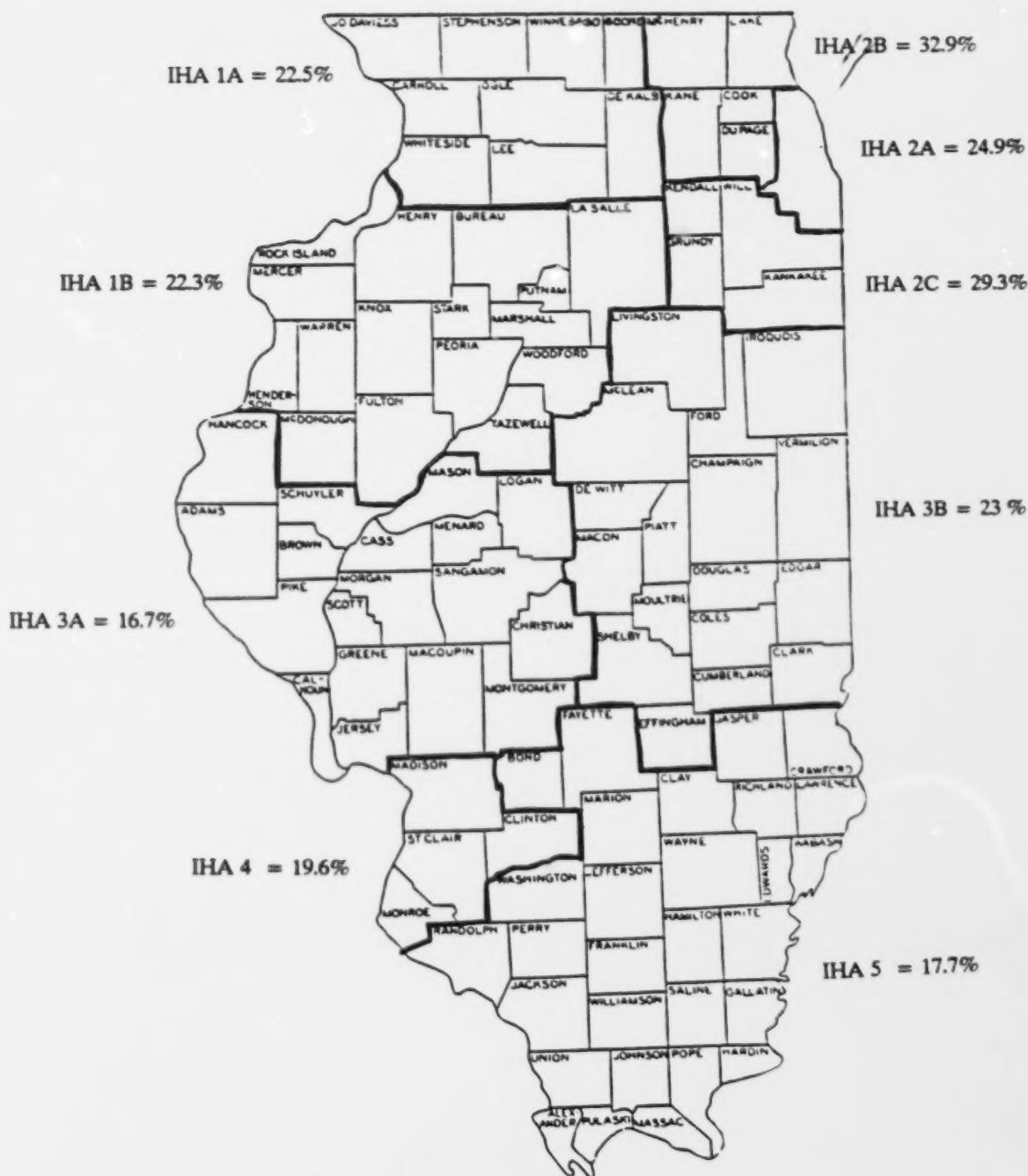


Table 2

PROJECTED CHANGE IN NEW JOBS IN THE
HEALTHCARE INDUSTRY IN ILLINOIS
BY HOSPITAL AREA
1988-2000

Hospital Area	Offices of Physicians	Offices of Dentists	Offices of Osteopaths	Offices of Other Practitioners	Nursing and Personal Care Facilities	Hospitals	Medical/Dental Laboratories	Home Health	Health and Allied Service	Total
Chicago (2A)	8,585	3,194	42	2,120	10,467	15,779	1,527	4,672	2,647	49,033
Chicago Metro-North (2B)	3,433	1,511	12	1,035	3,998	3,820	387	1,289	775	16,260
Chicago Metro-South (2C)	639	207	2	199	799	1,093	88	267	198	3,492
Northwest (1A)	858	222	0	309	1,187	860	50	197	289	3,972
North Central (1B)	1,158	363	10	226	2,016	1,710	213	767	200	6,663
East Central (3B)	1,525	279	5	232	1,652	1,417	101	705	358	6,274
West Central (3A)	516	183	0	166	1,634	756	53	326	239	3,873
Southeast (5)	467	91	1	204	1,327	578	26	356	183	3,233
Southwest (4)	435	122	0	203	940	657	118	606	280	3,361
STATE TOTAL	17,616	6,172	72	4,694	24,020	26,670	2,563	9,185	5,169	96,161
Change in Percent of New Jobs										
Chicago (2A)	38.5 %	31.3 %	40.4 %	56.2 %	45.9 %	12.1 %	53.2 %	211.9 %	103.7 %	24.9 %
Chicago Metro-North (2B)	38.5	31.3	42.6	60.4	61.3	15.1	53.2	211.7	103.7	32.9
Chicago Metro-South (2C)	36.4	28.6	41.2	53.7	48.9	15.9	47.6	145.1	103.2	29.3
Northwest (1A)	29.6	20.4	0.0	50.3	30.9	10.4	32.3	77.4	50.8	22.5
North Central (1B)	26.4	21.7	54.0	30.3	35.3	11.0	37.0	77.0	76.4	22.3
East Central (3B)	30.2	23.0	23.4	40.4	35.5	9.9	35.2	232.8	62.5	23.2
West Central (3A)	18.7	21.0	0.0	34.3	30.5	5.8	19.9	187.0	70.9	16.7
Southeast (5)	20.5	13.6	17.9	39.1	31.2	5.8	26.5	172.1	54.3	17.7
Southwest (4)	20.6	13.8	0.0	39.1	31.3	7.1	26.1	172.2	58.3	19.6
STATE TOTAL	33.6 %	27.9 %	38.6 %	50.4 %	39.8 %	11.5 %	45.7 %	175.2 %	85.5 %	24.3 %

Note: Shaded cells indicate the industry with the highest number and percent of openings in each region.

Source: State of Illinois Industry Employment Estimates 1988 Annual Average and Projected 2000 Employment Occupational Employment Statistics Industry Format
Prepared by the Illinois Occupational Information Coordinating Committee

The number and proportion of degrees in the health professions awarded to Blacks and Hispanics is shown in Table B-3 in Appendix B. These data show that minority representation among degree recipients in many of the health professions are significantly below their representation in the state's population, at 14.8 percent for Blacks and 7.9 percent for Hispanics.

The projected average annual job openings in health professions, found in Table B-4, shows that substantial growth is predicted for the majority of the professions. The largest increase in all of the health professions is expected to occur in allied health, with more than 10,000 job openings annually through the year 2000. The majority of health professions are above the state average of 12.78 percent in projected growth of jobs between 1988 and 2000.

Comparison of the number of 1990 graduates to annual demand in Table B-4 indicates that, with some exceptions, the supply and demand for most health professions is balanced. The supply of job entrants shown in this table includes only degree completers from community colleges and public and nonpublic universities. Other organizations provide non-degree training for health occupations including hospital-based nursing and allied health programs, industry training programs, secondary schools, and secondary and postsecondary vocational schools. Much of the short-term training required for home health aids and nurse assistants is provided through industry programs and non-degree programs in vocational schools and community colleges.

Table B-5 presents the total amount of expenditures in health professions grant programs administered by the Illinois Board of Higher Education and the Illinois Department of Public Health between fiscal years 1980 and 1990. Between fiscal years 1980 and 1990, total state grant expenditures increased over 20 percent. Substantial increases are noted in medicine, medical residencies, and optometry in the Health Service Education Grants program, as well as the family practice program of the Department of Public Health. Decreases in dentistry, podiatry, nursing, and allied health programs under the Health Services Education Grants Act reflect the declining enrollments in baccalaureate and above degree programs in these professions.

Table B-6 shows the amount of state appropriations expended for health education programs at public universities in fiscal year 1990. Across all fields, public universities expended more than \$288 million on health professions education.

Medical Education

Six Illinois institutions, two public and four nonpublic, offer first-professional degree programs that lead to the M.D. degree. Five of these programs are located in the greater Chicago area. The University of Illinois offers regional programs in Rockford, Peoria, and Urbana-Champaign, and Southern Illinois University offers a program in Springfield. In addition, the Chicago College of Osteopathic Medicine offers a first-professional degree in osteopathic medicine.

Between fall 1980 and fall 1990, total enrollment in medicine and osteopathic medicine experienced increases of 12 and 19 percent, respectively. However, all of the growth of enrollments in medicine occurred in private institutions in which there was a 24 percent increase, while public medical school enrollment declined three percent. The 1981 study called for medical school enrollments not to exceed 1980 entering class levels due to a national oversupply of physicians and reduction in federal funds for medical education. Public medical school enrollments have been maintained and are consistent with Board policy. Private medical school enrollments, however, have increased above the level recommended in 1981.

Despite the increase in total enrollment in medicine over the decade, the number of first-professional degrees granted in Illinois decreased by four percent. The number of graduates per year, however, still exceeds the average annual occupational demand of nearly 700 projected by the Department of Employment Security. A 1985 study by the American Medical Association (AMA) found that 48 percent of University of Illinois graduates; 43 percent of Loyola University, Rush

Table 3

MEDICAL EDUCATION AND OCCUPATIONAL DEMAND

	<u>1980</u>	<u>1990</u>	<u>Change</u>
<u>Fall Enrollments</u>			
Medicine	3,800	4,262	12.2%
Osteopathy	395	471	19.2%
<u>Degrees Granted</u>	<u>FY1981</u>	<u>FY1990</u>	<u>Change</u>
Medicine	1,072	1,031	(3.8%)
Black	4.4%	4.4%	
Hispanic	2.2%	5.3%	
Osteopathy	95	94	(1.0%)
Black	2.1%	0.0%	
Hispanic	1.1%	3.2%	
<u>Annual Occupational Demand</u>		<u>1990</u> 689	
<u>Practitioner to 100,000 Population</u>	191	229	19.9%

University, and Southern Illinois University graduates; 32 percent of Chicago Medical School graduates; 30 percent of Northwestern University graduates; and 25 percent of University of Chicago graduates remain in Illinois to practice.

According to the AMA's 1992 report on physician characteristics, the University of Illinois has graduated the highest number (10,744 graduates) of any medical school in the country. Illinois ranks third nationally, behind New York and Pennsylvania, in the total number of physicians graduated. Although over half of Illinois' graduates leave the state to practice, Illinois ranks third nationally in the percent of physicians who practice in the state in which they graduated from medical school.

Illinois is one of the top 10 states in the total number of practicing physicians and ranks sixth in the ratio of practitioners to population. Compared with 1966 and 1976 when Illinois ranked 16th and 18th, respectively, there has been improvement in the ratio of physicians to population. According to the AMA's 1990 edition of *Physician Characteristics and Distribution in the United States*, there were 229 physicians per 100,000 population in Illinois in 1990. Illinois appears to graduate sufficient medical students to meet the occupational demand, although concerns continue about the geographic maldistribution of physicians and the distribution of physicians across medical specialties.

The purpose for regionalizing of undergraduate medical education and medical residency programs was to promote practice in the underserved areas of downstate Illinois. Studies during the last decade by Southern Illinois University and the University of Illinois indicate that regional residency programs are effective in achieving this purpose. A significant proportion of physicians who complete residencies in downstate Illinois remain in the region to practice. Completion of undergraduate medical school downstate, however, does not appear to have as significant an effect on graduates' choice of location for practice.

The Board of Higher Education's 1982 report on medical education recommended an increase in the number of residencies to match the number of graduates in order to promote retention of Illinois residents. There are currently over 300 accredited residency programs in Illinois with almost 1,300, positions exceeding the number of medical school graduates by approximately 200 positions. In the 1992 national residency match, 82 percent of Illinois' residency positions were filled. Of the unfilled positions, 55 positions, or almost 25 percent, were in family practice programs.

Black representation in medicine did not increase between 1980 and 1990, remaining at 4.4 percent. Hispanic representation increased from 2.2 percent in 1980 to 5.3 percent of medical graduates in 1990, still below the 7.9 percent representation of Hispanics in the state's population. In the number of degrees granted, however, the number of Hispanics in medicine increased almost 50 percent. Among Illinois schools of medicine, the University of Illinois at Chicago granted the largest number of degrees to minorities in medicine in fiscal year 1990.

The state provides support to private schools of medicine through the Health Services Education Grants (HSEGA) administered by the Illinois Board of Higher Education and scholarship and residency programs administered by the Illinois Department of Public Health. Table B-5 shows that in fiscal 1990, HSEGA grants to private institutions for medical education and residencies totaled \$11.2 million, an increase of 16 percent over fiscal year 1980. Other financial support for medical students is available through the Illinois Department of Public Health's Medical Scholarship program. Funding for this program has substantially increased, from \$200,000 in 1980 to over \$2.6 million in 1990. Scholarships average \$21,555 per year per student. Students who accept these scholarships must attend Illinois medical schools and pursue a primary care specialty and practice in an underserved area. Since 1979, 379 students have received scholarships. Of the 337 students who received scholarships since 1985, 242 are still in school or residency programs, six are repaying, and 89 are practicing in medically underserved areas. State support for public schools of medicine is provided through institutional appropriations. Table B-6 shows that expenditures for medical education in 1990 totaled \$109 million at public universities and expenditures from state appropriations for the University of Illinois hospital were \$63 million.

Staff Conclusions on Medical Education. Between 1981 and 1990, enrollment in public schools of medicine declined, while enrollment at private schools increased. During the same period, the number of degrees awarded statewide declined about four percent. The supply of graduates from Illinois medical schools was over 1,000 in 1990, more than the projected annual demand of 700 physicians and surgeons for the state. However, Illinois schools of medicine attract students from throughout the country, and studies have shown that only about half of the graduates remain in the state to practice. Data provided by the American Medical Association indicate that the current supply of physicians per 100,000 population is consistent with the average for the nation. It appears that the appropriate balance of overall supply and demand has been achieved, and medical school enrollments should be maintained at the current levels. However, both public and private schools of medicine should increase efforts to enroll and retain minority students, particularly Black and Hispanic students.

In spite of overall adequate numbers of physicians practicing in Illinois, there continues to be a problem in the geographic distribution of physicians and an insufficient number of family practice physicians who practice in underserved areas. The regionalization of undergraduate medical education appears to have had limited success in promoting practice in Illinois and promoting practice in primary care specialties. In terms of the percentage of graduates and absolute number of graduates who enter practice in Illinois, Southern Illinois University and the University of Illinois at Chicago appear to supply the majority of physicians who practice in Illinois, especially in central and southern Illinois. Efforts should be made to increase the number of graduates from the University of Illinois programs in Peoria, Rockford, and Urbana-Champaign who to return to practice in Illinois.

Although the total number of medical residencies and number of family practice residencies reflect Board goals, there still exists a large number of underserved areas in Illinois without a sufficient number of primary care practitioners. Both private and public medical schools should

promote family practice and primary care specialties in the undergraduate medical curriculum and explore opportunities to expand the regionalization of residencies in primary care specialties.

Dental Education

There are four first-professional degree programs in dentistry offered in Illinois, evenly distributed between public and private institutions, with three programs in the Chicago area and one downstate at Southern Illinois University at Edwardsville. In dentistry, there was a 38 percent enrollment decline between 1980 and 1990. Recently, Loyola University of Chicago announced its decision to close its dental school in 1993. The full consequences of this closure are yet to be determined, but a significant reduction in dental program capacity in Illinois is evident. Consequently, the 1982 Board policy limiting dental enrollments to 1981 entering class levels has not only been met, but other factors, such as lower income potential and competition for quality students, appear to be influencing declining dental school enrollments.

Table 4			
DENTAL EDUCATION AND OCCUPATIONAL DEMAND			
	<u>1980</u>	<u>1990</u>	<u>Change</u>
<u>Fall Enrollments:First Prof.</u>	1,783	1,112	(37.6%)
<u>Number of Degrees</u>	<u>FY1981</u>	<u>FY1990</u>	
Black	350	331	(5.4%)
Hispanic	1.4%	1.2%	
	1.1%	3.3%	
<u>Annual Occupational Demand</u>		424	
<u>Practitioner to 100,000 Population</u>		68	

In 1970, there were 50 practicing dentists in Illinois per 100,000 population. In 1990, there were approximately 68 dentists per 100,000 population in Illinois according to Department of Professional Regulation. Illinois has a higher ratio of dentists to population than the national average of 58, as reported by U.S. Department of Health and Human Services in 1990. The 1990 Department of Professional Regulation data show that there were almost 8,000 active, licensed general dentists and over 1,000 licensed specialists in dentistry in Illinois. In 1990, there were no counties without an active dentist.

The Illinois Department of Employment Security projects an average of over 400 new dentists needed annually in Illinois through the year 2000. With only 331 graduates from Illinois dental schools in 1990 and a continuing decline in enrollments, an undersupply of dentists is possible in the future. In addition, the projected growth of the profession by 31 percent between 1988 and 2000 is being shaped by the changing demographics and increased need for dental care by an aging population. The impact of Loyola Dental School closing in 1993 will increase the potential for a significant shortage of dentists.

Minorities continue to be underrepresented in dentistry. The number and percentage of Blacks receiving first-professional degrees in dentistry has decreased over the decade, while the percentage

of Hispanics receiving degrees has increased. Both, however, are significantly less than 1990 state population percentages of 14.8 for Blacks and 7.9 for Hispanics.

Higher education expenditures for dental education at Southern Illinois University at Edwardsville and the University of Illinois at Chicago were slightly over \$19 million in fiscal year 1990. As dental enrollments declined during the 1980s, state appropriations also decreased in Health Service Education Act Grants for dentistry, as shown in Table B-5.

Staff Conclusions on Dental Education. With the continuing decline of enrollments and degrees granted in Illinois dental schools, coupled with the closing of the Loyola University Dental School, the University of Illinois at Chicago, Southern Illinois University at Edwardsville, and Northwestern University should consider increasing their program capacity over the next several years.

Other Medical Education Professions

As shown in Table B-1, four institutions--three nonpublic and one public--are the sole providers of medical education programs in podiatry, chiropractic, optometry, and veterinary medicine in Illinois. The Illinois College of Optometry offers the first-professional degree of Doctor of Optometry. The Dr. William M. Scholl College of Podiatric Medicine grants the Doctor of Podiatric Medicine. The National College of Chiropractic is one of 17 schools in the U.S. that is accredited to provide chiropractic education. The University of Illinois at Urbana-Champaign offers the Doctor of Veterinary Medicine and the M.S. and the Ph.D. in Veterinary Medicine. Total enrollment and degrees granted declined in all four professions over the decade.

There were 955 active, licensed podiatrists in Illinois in 1990, according to the Illinois Department of Professional Regulation. Ninety-five percent of these practitioners are graduates of the Dr. William M. Scholl College of Podiatric Medicine, and over 70 percent practice and live in Cook County and surrounding counties. Compared with the United States, the number of practicing podiatrists to 100,000 population in Illinois exceeded both the national average of 4.7 in 1988 and the established "ideal" of 6.7 set by the Department of Health and Human Services in 1981. In 1990, the number of graduates from the Dr. William M. Scholl College of Podiatric Medicine was sufficient to meet the average annual openings of about 120 jobs projected by the Illinois Department of Employment Security. The Dr. William M. Scholl College of Podiatric Medicine plans to limit future enrollments to 120 entering students to assure a quality educational experience and availability of graduate residency placement opportunities.

Illinois led the nation in the number of practicing optometrists in 1977. At the end of 1990, there were over 1,500 active licensed optometrists in the State of Illinois according to the Department of Professional Regulation. Illinois' ratio of 13 optometrists per 100,000 population surpasses the national average of 9.7 reported by the Department of Health and Human Services in 1988. In 1990, Illinois College of Optometry graduated 136 optometrists, which is sufficient to meet the average annual openings of about 100 projected by the Illinois Department of Employment Security.

The 16 chiropractors in Illinois per 100,000 population is equivalent to the national average of 15.8 found in 1988 by the Department of Health and Human Services. In 1990, the College graduated 202 students, about six times the number of job openings projected for the state. Because National College of Chiropractic is one of only 17 schools in the United States, however, it is a regional supplier of chiropractors for the entire midwest. Thus, an oversupply of chiropractors in Illinois is not likely, although the practitioner to population ratio indicates that Illinois is at least equal to other states.

According to the Department of Health and Human Services, the supply of veterinarians grew over 50 percent between 1975 and 1988, with approximately 47,500 actively practicing veterinarians in the United States. The national practitioner to population ratio for veterinarians is 21, compared to 17 in Illinois. The U.S. Department of Labor projects that the national demand for veterinarians

Table 5

OTHER MEDICAL EDUCATION AND OCCUPATIONAL DEMAND

	<u>1980</u>	<u>1990</u>	<u>Change</u>
<u>Fall Enrollments: First Prof.</u>			
Podiatry	645	378	(41.4%)
Optometry	597	547	(8.4%)
Chiropractic	975	792	(18.8%)
Veterinary	356	308	(13.5%)
	<u>FY1981</u>	<u>FY1990</u>	
<u>Number of Degrees</u>			
Podiatry	152	128	(15.8%)
Black	3.9%	7.0%	
Hispanic	1.9%	0.0%	
Optometry	138	136	(1.4%)
Black	0.7%	1.5%	
Hispanic	0.0%	3.7%	
Chiropractic	217	202	(6.9%)
Black	0.9%	0.5%	
Hispanic	0.0%	1.0%	
Veterinary	85	84	(1.1%)
Black	0.0%	0.0%	
Hispanic	0.0%	1.2%	
<u>Annual Occupational Demand</u>			
Podiatry		122	
Optometry		108	
Chiropractic		29	
Veterinary		59	
<u>Practitioner to 100,000 Population Ratio</u>			
Podiatry		8	
Optometry		13	
Chiropractic		16	
Veterinary		17	

and veterinary inspectors will increase from 46,000 in 1988 to 63,000 by the year 2000, a growth rate of 37 percent. Based on this projection, the current supply is expected to meet the demand. In Illinois, enrollments in veterinary medicine have decreased from 356 in fall 1980 to 308 in fall 1990. The number of graduates in fiscal year 1990 was 84, slightly more than the 60 average annual openings projected by the Illinois Department of Employment Security.

Table B-3 and Table 5 show the number and percentage of graduates in podiatric, optometric, chiropractic, and veterinary medicine between 1981 and 1990. Hispanic representation improved

slightly over this period in optometric, chiropractic, and veterinary medicine, but declined to zero in podiatric medicine. Black representation was highest in podiatric medicine at seven percent of fiscal year 1990 graduates. Between 1975 and 1988, the number of female veterinarians increased almost 250 percent. Women represented 21 percent of the 1990 graduating class in podiatry, an increase of 59 percent since fiscal year 1980 when 17 of the 152 graduates were female. The trend of more women entering the fields of podiatric medicine and veterinary medicine is expected to continue. Both Blacks and Hispanics, however, continue to be underrepresented in these professions compared with state population averages of 14.6 percent and 7.9 percent, respectively.

Table B-5 provides an analysis of state appropriations of Health Service Education Grants to podiatric, optometric, and chiropractic education. Total grant expenditures for podiatric medical education have decreased about 33 percent between fiscal years 1980 and 1990, while grants for optometric medical education have increased over 70 percent in the same period. Health Services Education Grants to the National College of Chiropractic are included in the medicine category. Senate Bill 2138, passed by the Illinois General Assembly in 1992, provides grants for podiatric residency programs and student scholarships. This grant program is to be administered by the Illinois Department of Public Health and funded through a percentage of fees collected by the Illinois Department of Professional Regulation and deposited in the Podiatric Disciplinary Fund.

State support for veterinary medicine is provided to the University of Illinois through its regular operations budget. The fiscal year 1990 *Program Major Cost Study* shows that veterinary medicine at the University of Illinois cost \$910 per credit hour and veterinary medical science graduate programs cost almost \$1,700 per credit hour. Table B-6 shows that the University of Illinois expended approximately \$18 million in state-appropriated funds on instruction, organized research, public service, and administration and support for veterinary medicine in fiscal year 1990.

Conclusions on Other Medical Education. The projected occupational demand for podiatry, optometry, chiropractic, and veterinary medicine appears to met by the number of graduates from Illinois institutions. Program capacity in these fields should be maintained at current levels. Because these programs serve national, as well as state occupational demand, an oversupply in veterinary medicine, chiropractic, and optometric medicine is not expected.

Pharmacy Education

The University of Illinois at Chicago offers one of two first-professional degree programs that lead to the Doctor of Pharmacy. The University also offers the M.S. and Ph.D. in Pharmacy. In 1991, the Chicago College of Osteopathic Medicine received approval to offer the Bachelor in Pharmacy for entry-level practice and Doctor of Pharmacy for advanced entry-level practice. The College expects to enroll its first classes in the fall of 1992.

Although the Board's goal for pharmacy education in Illinois was considered to have been met at the time of the 1981 study, that goal was based on enrollments of over 700. Both enrollments and the number of degrees granted have since reverted to 1960s levels, decreasing by about 25 percent. During this time, the University of Illinois eliminated its bachelor's entry-level program and implemented the Doctor of Pharmacy. Chicago College of Osteopathic Medicine plans to accept 100 students annually into its programs, which would take enrollments back up to the original goal.

In the past twenty years, the pharmacist to population ratio in the U.S. has not increased, remaining at 63 practitioners per 100,000 population. In Illinois, however, the ratio increased to 74 by 1990. There were over 8,600 active, registered pharmacists in Illinois in 1990, according to the Illinois Department of Professional Regulation. The average annual projected demand of over 500 pharmacists is significantly more than the 126 graduates in 1990. With the addition of 100 graduates from the College of Osteopathic Medicine, it appears that the supply will increase to approximately 230.

Table 6

PHARMACY EDUCATION AND OCCUPATIONAL DEMAND

	<u>1980</u>	<u>1990</u>	<u>Change</u>
<u>Fall Enrollments: Entry-Level</u>	853	640	(24.9%)
<u>Number of Degrees</u>	<u>FY1981</u>	<u>FY1990</u>	
Black	172	126	(26.7%)
Hispanic		6.3%	
		1.6%	
<u>Annual Occupational Demand</u>		<u>1990</u>	
		509	
<u>Practitioner to Population Ratio</u>		74	

Blacks and Hispanics continue to be underrepresented in pharmacy, with only 6.3 percent of degrees granted to Blacks and 1.6 percent of degrees granted to Hispanics in 1990. At the national level, the Department of Health and Human Services reported in 1988 that over 10 percent of active pharmacists were minorities. Women now account for over 60 percent of pharmacy enrollments.

The fiscal year 1990 *Program Major Cost Study* showed total instructional expenditures for pharmacy students to be \$386 per credit hour. Table B-6 shows that the University of Illinois at Chicago in fiscal year 1990 expended more than \$9.3 million of state appropriations on instruction, organized research, public service, and administration and support in the discipline of pharmacy. The pharmacy programs of the Chicago College of Osteopathic Medicine are the first programs offered by private institutions. Legislation has been enacted to make this program eligible for HSEGA support in the future.

Staff Conclusions on Pharmacy Education. Based upon the assumption that the Chicago College of Osteopathic Medicine will graduate 100 pharmacists per year by 1996, the total number of graduates from Illinois schools of pharmacy will be about 220, still considerably less than the projected annual demand of about 500. Statewide capacity in pharmacy education should be expanded to meet demand, especially baccalaureate entry-level pharmacy programs.

Nursing Education

There are 34 institutions approved by the Department of Professional Regulation to offer baccalaureate nursing programs and an additional eight institutions offer baccalaureate completion programs for registered nurses. Forty-three community colleges are approved to offer the associate degree in nursing, and five hospitals are approved to offer diploma programs. All of these degrees allow entry into the profession, following licensure as a registered nurse (RN). Community colleges continue to provide the majority of programs to educate registered nurses. Diploma programs have decreased in number from 20 in 1980 to five in 1992, diminishing the capacity and decreasing the number of graduates by over 1,000 per year. Since the Board of Higher Education's last study, the number of private institutions offering baccalaureate degrees in nursing has risen from 17 to 27. Four

institutions offer doctoral degrees in nursing and 12 offer master's degrees in various nursing specialties. There has been an increase of 10 graduate programs in nursing since 1980.

Off-campus offerings in nursing have increased substantially over the past decade. In response to recommendations in the Board's 1980 study, 10 institutions have received approval to offer baccalaureate and graduate programs in 20 community college districts throughout the state. Access to baccalaureate nursing education is available in every health service region in Illinois.

Table 7

NURSING EDUCATION AND OCCUPATIONAL DEMAND

	<u>1980</u>	<u>1990</u>	<u>Change</u>
<u>Fall Enrollments</u>			
ADN	9,044	9,263	2.4%
BSN	6,262	4,832	(22.8%)
Diploma	3,483	665	(80.9%)
<u>Total All Levels</u>	<u>18,789</u>	<u>14,760</u>	
<u>Number of Degrees</u>			
	<u>FY1981</u>	<u>FY1990</u>	
ADN	1,862	1,656	(11.1%)
Black		11.7%	
Hispanic		2.2%	
BSN	1,516	1,518	0.1%
Black		11.7%	
Hispanic		2.5%	
Diploma	1,203	168	(86.0%)
<u>Total All Levels</u>	<u>4,581</u>	<u>3,342</u>	
<u>Annual Occupational Demand</u>			
		<u>1990</u>	
		4,184	
<u>Practitioner to 100,000 Population</u>			
		890	
<u>Cost Per Credit Hour-Public Institutions</u>			
ADN		\$235	
BSN		\$368	

The Commission on Nursing reported in 1988 that there was a shortage of registered nurses nationally. The shortage has not resulted from a diminished supply, but rather an increase in demand. Nationally, 8.5 percent of nursing positions were vacant in 1989. In a more recent study of Chicago hospitals, vacancy rates rose to 12.5 percent in 1991.

Enrollments in Illinois community college associate degree nursing programs have returned to 1980 levels, after decreasing to a low of 6,158 in fall 1987. According to the Illinois Community College Board, there currently are waiting lists for admission to community college nursing programs. The number of associate degrees in nursing (ADN) has decreased from 1,862 in fiscal year 1981 to 1,656 in fiscal year 1990, but is expected to rise to 1980 levels with the increase in enrollments.

According to the National League for Nursing, Illinois ranked sixth in the number of baccalaureate nursing graduates in the United States. The ratio of registered nurses to population in Illinois at the end of 1990 was 890 RN's per 100,000 population, greater than the national average of 668 reported by the Department of Health and Human Services in 1990. The number of Bachelor of Science in Nursing (BSN) degrees awarded has remained steady since 1981.

Graduate program enrollments have increased 41 percent, and degrees granted have increased 56 percent over the time period, providing nurse administrators, educators, and specialists to the profession. Graduate enrollments and degrees are not included on Table 7 because they do not contribute to the supply and demand picture for registered nurses. Still, recent studies have suggested that the percentage of practicing educators is declining due to an increase in part-time faculty and loss to specialty practice in industry. Concerns remain regarding adequate numbers of nurses with advanced training for specialty practice and for teaching faculty.

As shown in Table B-3 and Table 7, the percentage of Black and Hispanic degree recipients in both ADN and BSN programs in fiscal year 1990 was 11.7 percent for Blacks and slightly over two percent for Hispanics. The percentage of graduate nursing degrees awarded to Blacks has increased to 5.7 percent of degrees awarded, but the percentage of graduate degrees awarded to Hispanics has remained the same at 1.3 percent.

As reported in the fiscal year 1990 *Program Major Cost Study*, the instructional expenditures for nursing students averaged \$368 per credit hour at public universities and \$235 per credit hour at community colleges. As can be seen in Table B-6, the total expenditures by public institutions for all costs related to nursing instruction, organized research, public service, and administration and support services in fiscal year 1990 was over \$19 million.

Under the Health Services Education Grants Act, nonpublic institutions receive funding for nursing students who are Illinois residents. Total grant expenditures for nursing peaked in fiscal year 1984, then returned to near 1980 levels. The Baccalaureate Nursing Scholarship program administered by the Illinois Department of Public Health was not funded for fiscal year 1993. A new scholarship program, similar in concept to podiatry's, is funded from Department of Professional Regulation fees, and is in the process of being implemented.

Staff Conclusions on Nursing Education. The approximately 3,300 graduates from the three types of RN programs is not adequate to meet the projected demand of over 4,000 registered nurses needed annually in Illinois. In order to meet both current and projected occupational demand in nursing, statewide capacity in nursing should be expanded. New associate degree programs should be established to respond to current and future occupational demands, as well as the increased student demand. As current policy states, existing baccalaureate programs in nursing should increase their enrollments, and existing accredited programs should offer off-campus baccalaureate completion programs where a demonstrated need for such program exists. No new free-standing baccalaureate degree completion programs in nursing should be established unless a compelling need can be demonstrated. Master's and doctoral degree programs should continue to be expanded to meet the demand for nursing educators and clinical specialists.

Allied Health

In this report, allied health is defined to include all those programs listed under Allied Health in the National Center for Educational Statistics Classification of Instructional Programs, plus the three commonly accepted allied health professions of Audiology and Speech Pathology, Medical Records Administration, and Medical Laboratory Technology. Health Services Administration is being separately analyzed in this study.

The majority of allied health programs are offered by community colleges. Many of these programs are certificate programs of one year or less. Table B-1 displays the number of programs by level and sub-category under allied health. Only 34 percent of allied health programs offered in Illinois are at the baccalaureate level or above. Sixty percent of allied health programs are found in community colleges, 12 percent in public universities, and 28 percent in private institutions.

Table 10			
ALLIED HEALTH EDUCATION AND OCCUPATIONAL DEMAND			
	<u>1980</u>	<u>1990</u>	<u>Change</u>
<u>Fall Enrollments</u>			
Associate/Cert. Programs	8,356	9,661	15.6%
Baccalaureate Programs	3,499	2,822	(19.3%)
Graduate Programs	767	1,022	33.2%
	<u>FY1981</u>	<u>FY1990</u>	
<u>Number of Degrees</u>			
Associate/Cert. Programs	3,125	3,625	16.0%
Black		18.5%	
Hispanic		2.9%	
Baccalaureate Programs	862	684	(20.6%)
Black		10.1%	
Hispanic		2.8%	
Graduate Programs	349	383	9.7%
Black		4.4%	
Hispanic		2.0%	
<u>Annual Occupational Demand</u>		<u>10,673</u>	
Occupational Programs		9,618	
Professional Programs		1,055	

The Department of Health and Human Services estimates that there are approximately 340 allied health professionals per 100,000 population in the United States. In Illinois, the number of practitioners to population ratio can be calculated only for those allied health professions licensed by the Department of Professional Regulation. For 1990, the following ratios per 100,000 population were calculated: licensed practical nurse 241, dental hygienist 33, optometry ancillary 53, pharmacy technician 119, occupational therapist 15, physical therapist 24, physical therapist assistant 4, and speech and language pathologist 29.

Enrollments in community college allied health programs increased 16 percent between fall 1980 and fall 1990, while enrollments in baccalaureate degree allied health programs decreased almost 20 percent. By 1990, enrollments in certificate and associate degree programs were more than three times that of programs requiring a baccalaureate degree. Consistent with enrollment patterns, the number of degrees granted between fiscal years 1981 and 1990 increased 16 percent at community colleges and decreased 21 percent for baccalaureate programs in allied health.

According to the Illinois Department of Employment Security, the total projected, annual openings for allied health professions considered in this report is almost 10,000 new jobs. Of this total demand, approximately 9,500 are in short-term training programs or in college-level certificate or associate degree programs. Over 1,000 are in professions that require preparation at the baccalaureate degree level or above.

Table B-4 shows the average annual demand projected by the Illinois Department of Employment Security for specific allied health professions. At the associate and certificate levels, the occupations of home health aide, licensed practical nurse (LPN), and nurses aide positions represent almost 60 percent of the total occupational demand in all of allied health. Although higher education provides programs in these areas, additional sources of supply are also found in the healthcare facilities and secondary vocational education, particularly for those occupations that require only short-term training. For example, in fiscal year 1989, about 300 students completed non-collegiate LPN programs, and over 1,400 completed non-collegiate nurse aide programs. Table B-4 also indicates potential shortages in the supply of opticians, surgical technicians, pharmacy assistants, dental assistants, dental laboratory technicians, medical assistants, physical therapist assistants, physical therapists, recreational therapists, physician assistants, medical records technologists, and clinical laboratory technologists.

Allied health programs have increased the number and percentage of Black graduates at associate and baccalaureate levels. For certificate and associate degree programs, the percentage of degrees granted to Blacks is above the state population percentage of 14.6, while for baccalaureate degrees the percentage of Blacks receiving degrees is 10 percent. Hispanic representation is slightly less than most of the other health fields. There continues to be underrepresentation of Blacks and Hispanics in the baccalaureate and graduate levels of allied health programs.

Health Service Education Grant Act funding for allied health decreased 20 percent over the decade, from a little over \$1.0 million in fiscal year 1980 to \$827,000 in 1990, in spite of headcount enrollment increases. This finding suggests that increasing numbers of allied health students are pursuing programs on a part-time basis. In the fiscal year 1990 *Program Major Cost Study*, the total instructional cost for allied health programs at public universities ranged from a low of \$201 per credit hour for dental hygiene to a high of \$466 per credit hour for rehabilitation services. Costs per credit hour for allied health programs at community colleges in fiscal year 1990 averaged \$164. Total expenditures of state-appropriated funds to public universities for allied health education were almost \$19 million in fiscal year 1990.

Staff Conclusions on Allied Health Education. Potential imbalances in supply and projected demand are found in several allied health occupations that require preparation at the certificate or associate degree levels--particularly physician assistant, dental assistant, dental laboratory technician, surgical technician, pharmacy assisting, physical therapist assistant, and licensed practical nurse. Illinois institutions, particularly community colleges, should increase capacity in these fields if there is sufficient interest among potential students. Similarly, capacity may need to be expanded in baccalaureate programs in some fields, particularly physical therapy and clinical laboratory technology. Because many of the allied health programs require costly clinical components, colleges and universities should seek cooperative arrangements with clinical affiliates for cost-effective program delivery.

Health Services Administration and Public Health

There are seven undergraduate programs and 10 graduate programs in health services administration. Approximately half of the undergraduate programs and one-third of the graduate programs are at public institutions. In public health, there are 10 master's programs and two doctoral programs in public health in the state, including several in nonpublic institutions.

Table 11

HEALTH SERVICE ADMINISTRATION AND PUBLIC HEALTH
AND OCCUPATIONAL DEMAND

	<u>1980</u>	<u>1990</u>	<u>Change</u>
<u>Fall Enrollments: All Degrees</u>			
Health Service Administration	531	1447	172.5%
Public Health	199	408	105.0%
 <u>Total Degrees Granted:</u>			
	<u>FY1981</u>	<u>FY1990</u>	
Health Service Administration	128	506	295.3%
Black		16.2%	
Hispanic		3.8%	
Public Health	103	94	(8.7%)
Black		8.5%	
Hispanic		1.1%	
 <u>Annual Occupational Demand</u>			
Health Service Administration		328	
 <u>Cost Per Credit Hour-Public Universities</u>			
Health Service Administration		\$241	
Public Health		\$967	

Enrollments in both health services administration and public health grew by more than 100 percent over the past decade. The number of degrees granted increased greatly for health services administration. Degrees in public health, however, decreased nine percent. In 1980, the majority of degrees granted in both professions were awarded by public institutions. By 1990, however, almost 60 percent of degrees in health services administration were awarded by nonpublic colleges and universities.

The occupational demand for health administrators is projected to be about 300 annually in Illinois, much less than the number of graduates from undergraduate and graduate programs in health services administration in Illinois, although these programs also provide professional development opportunities for students already employed in the field.

The University of Illinois at Chicago enrolls the majority of students and awards the majority of the degrees in public health. Data regarding demand for public health professionals were not included in the Illinois Department of Employment Security study, although the recent U.S. Department of Health and Human Services study concluded that there is a shortage and a "growing crisis in public health education." The Department called for increasing enrollments in public health programs.

Representation of Blacks in baccalaureate programs in health services administration is higher than the percentage in the state population. At the graduate level in health services administration, however, Black degree recipients represented only 4.5 percent of all graduates in fiscal year 1990. The

percentage of Blacks receiving master's degrees in public health has increased to 8.5 percent. Hispanics continue to be underrepresented at all levels in both health services administration and public health.

In the fiscal year 1990 *Program Major Cost Study*, the average total instructional expenditures for health services administration students in public universities was \$241 per credit hour and about \$960 per credit hour for public health programs at the University of Illinois. Table B-6 shows that almost \$3 million in state appropriations to public universities were expended for health services administration and \$7 million for public health.

Staff Conclusions on Health Services Administration and Public Health Programs. Statewide capacity in health services administration should be reduced in public and nonpublic universities to achieve a better balance with current and projected occupational demand. Institutions with programs in public health should evaluate current and projected occupational demands for public health within the state and adjust program capacity to provide cost-effective and quality programs.

Summary and Conclusions

Throughout the 1980s, the overall total number of degrees granted in all the health professions increased 4.5 percent, while the number of degrees granted in all other fields of study increased 12 percent. Significant growth is noted in allied health certificate and associate degree programs and health services administration during this period, while pharmacy, dentistry, and podiatry showed significant decreases in the number of degrees granted between 1981 and 1990.

The Board's policies call for minority representation in all health professions programs to correspond to the racial and ethnic population of the state. One major finding of this study is the continued inadequacy of Black and Hispanic participation in most of the health professions with the exception of certain allied health fields and nursing education. The need persists for further improvement in participation of underrepresented groups in the health professions.

This review also has shown that progress has been made in achieving some of the Master Plan goals set by the Board of Higher Education for medical education. Public universities have maintained enrollment levels at about 1981 levels as recommended by the Board. The number of medical residency programs has been expanded to meet the goal of establishing enough first-year residency positions to equal the number of graduates from Illinois medical schools. The number of family practice and primary care physicians practicing in underserved areas in Illinois continues to be inadequate, however, and residency programs in primary care specialties need to be emphasized and expanded in order to promote practice in underserved rural and urban areas.

Policies related to enrollment limits on dental and veterinary school enrollments have been maintained throughout the last decade and have resulted in a stabilization of supply that meets current and projected demand in these fields. There is some concern, however, regarding declining dental school enrollments and a potential shortage before the year 2000.

In comparing annual degrees granted to occupational demand, several health professions were identified as potentially undersupplied. The major health professions with shortages in Illinois include: pharmacy, dentistry, nursing, physical therapy, physician assistant, clinical laboratory technology, licensed practical nursing, home health aides, and nurse's aides. Program capacity adjustments should be made based on the findings in this report and in the context of the Illinois Board of Higher Education's priorities, quality, and productivity initiative.

The Health Services Education Grants Act (HSEGA) was established to promote Illinois residents' participation in health professions in Illinois nonpublic institutions and to increase opportunities for minorities in the health professions. The review of HSEGA expenditures and grant

rates for the 11 professions, coupled with additional information presented in this report, suggests that current grant incentives have promoted Illinois resident participation, but have not sufficiently improved minority representation or practice in underserved areas. Further, grant rates should promote appropriate capacity adjustments consistent with occupational demand in the various health professions.

The Board of Higher Education's current health professions policies were adopted over 10 years ago. Findings in this report indicate that several policies are no longer relevant and others need to be changed to reflect current occupational demands. Current policies should be reviewed in the context of these findings, as well as the Board's priorities, quality, and productivity initiative.

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APPENDIX A

ILLINOIS BOARD OF HIGHER EDUCATION POLICIES ON HEALTH PROFESSIONS EDUCATION (Adopted 1981 and 1982)

1. The Illinois Board of Higher Education reaffirms the goal for all health professions programs of a minority enrollment that corresponds to the racial and ethnic population of the state or of the specific area within the state served by an institution.
2. Medical school enrollments should not exceed 1980 entering class levels.
3. The regionalized medical education programs should be continued, and modifications in such programs, if any should be directed to establishing affiliated residency programs in remaining underserved rural and urban areas.
4. The Illinois Board of Higher Education reaffirms the goals of emphasizing primary-care specialties and of establishing enough first-year residency positions in programs affiliated with medical schools to equal the number of graduates from the medical schools.
5. New allied health education programs should be approved only if they are consistent with the institution's mission, meet documented specific manpower needs, are assured of adequate clinical affiliations, and do not contribute to over-specialization.
6. Institutional reviews of allied health education programs should give particular attention to the qualitative aspects of programs and to the employability of program graduates.
7. Master's and doctoral degree nursing programs should continue to be expanded.
8. Existing baccalaureate degree programs in nursing should increase their enrollments, and existing accredited programs should offer off-campus baccalaureate completion programs where a demonstrated need for such programs exists. No new generic nursing programs and no new free-standing baccalaureate degree completion programs in nursing should be established unless a compelling need can be demonstrated.
9. No new associate degree programs in nursing should be established unless a compelling need can be demonstrated.
10. Problems related to the transfer of credit from associate degree and diploma programs to baccalaureate degree programs in nursing should be identified and reported to the Illinois Board of Higher Education.
11. Veterinary medicine school enrollments should not exceed 1980 entering class levels.
12. The entering class size of each Illinois dental school should be modestly reduced below the Fall 1981 level, and staff should continue to monitor enrollment trends and the need for dental manpower throughout the state.
13. The Illinois Board of Higher Education's highest priorities for medical education should be programs that will cause graduates to practice in medically underserved areas in the state and that will increase substantially the representation of racial and ethnic minorities among physicians. Resources for such programs should be made available from state resources currently committed to medical education.

14. The Illinois Board of Higher Education should give priority to existing programs designed to increase the number of minorities qualified for medical education and increase the number of minorities in medical education.
15. The Illinois Board of Higher Education should continue to monitor minority enrollments in medical education and, if medical schools do not achieve minority enrollment goals, seek statutory authority for funding the Meharry Medical College proposal, with such funds to be reallocated from existing state allocations to medical schools and with medical school enrollments reduced accordingly.
16. The State of Illinois should expand the scholarship program under the Illinois Department of Public Health in order to support 100 graduates per year or should establish a similar replacement program which includes an obligation to practice in an underserved area, with penalty for failure to practice in an underserved area, and emphasis on minority students and students from medically underserved areas.

APPENDIX B

Table B-1 NUMBER OF DEGREE PROGRAMS IN THE HEALTH PROFESSIONS

Table B-2 DEGREES CONFERRED IN HEALTH PROFESSIONS FY1981 TO
FY1990 BY SELECTED FIELD

Table B-3 NUMBER AND PERCENT OF DEGREES AWARDED TO BLACK
AND HISPANIC STUDENTS BY LEVEL AND HEALTH DISCIPLINE

Table B-4 PROJECTED JOB OPENINGS AND EMPLOYMENT CHANGE IN
HEALTH OCCUPATIONS AND DEGREES CONFERRED IN
RELATED DISCIPLINES

Table B-5 EXPENDITURES FOR HEALTH PROFESSIONS GRANTS

Table B-6 ILLINOIS PUBLIC UNIVERSITIES' FISCAL YEAR 1990
EXPENDITURES FROM STATE APPROPRIATED FUNDS FOR
INSTRUCTION, RESEARCH, PUBLIC SERVICE, AND SUPPORT IN
THE HEALTH PROFESSIONS

Table B-1

NUMBER OF DEGREE PROGRAMS IN THE HEALTH PROFESSIONS

Profession	Community Colleges		Four-Year Public and Private Institutions							Total by Institutional Type			
	Certificate	Associate	Associate	Certificate	Bachelor of Science	Master of Science	First Professional	Advanced Certificate	PhD	Community College	Public	Private	Total
Medicine ¹							10				5	5	10
Osteopathic Medicine ¹							1					1	1
Dental Medicine ¹							4				2	2	4
Podiatric Medicine ¹							1					1	1
Optometric Medicine ¹							1					1	1
Chiropractic Medicine ¹							1					1	1
Veterinary Medicine ¹							1				1		1
Pharmacy					1	1	2		1		3	2	5
Nursing		43	1		42	35			4	43	16	66	125
Allied Health	164	99	20	14	83	43	0	10	11	263	52	124	439
A. Dental Auxiliaries	11	6	3	2	2					17	2	5	24
B. Diagnostic Services	45	36	3		7	1				81	4	7	92
C. Mental Health	26	14	2	4	4	9		3		40	3	19	62
D. Misc. Allied Health Services	17	18	8	5	2	1				35	1	15	51
E. Nurse-related	64		1	1						64		2	66
F. Ophthalmic Tech		1								1			1
G. Rehabilitation Services		15	1	1	25	16		3	1	15	14	33	62
H. Audiology/Language Pathology					13	12		2	5		17	15	32
I. Medical Lab Tech	1	9	2	1	29	4		2	5	10	8	28	46
J. Medical Records					3						3		3
K. Other	99		3		7					99	1	4	104
Health Service Admin.					7	10					5	12	17
Public Health						10			2		8	4	12
Total Number of Programs	263	142	24	14	142	99	21	10	18	405	93	223	721

¹Includes only the number of First Professional degree programs that lead to practice.

Source: Illinois Board of Higher Education Inventory of April 1992 and Illinois Community College Board Inventory of March 1992

Table B-2
DEGREES CONFERRED IN HEALTH PROFESSIONS FY1981 to FY1990
BY SELECTED FIELD

1980-1981							
	AAS	Cert	BS	MS	1st Prof	PhD	Totals
Medicine					1,072		1,072
Osteopathic Medicine					95		95
Dental Medicine			106	4	350		460
Podiatric Medicine					152		152
Optometric Medicine			44		138		182
Chiropractic Medicine					217		217
Veterinary Medicine			93		85		178
Pharmacy			172	5		5	182
Nursing	1,862		1,516	324		9	3,711
Allied Health	1,013	2,112	862	335		14	4,336
Health Service Administration			19	109			128
Public Health				98		5	103
Totals	2,875	2,112	2,812	875	2,109	33	10,816

1989-1990								Percent Change
	AAS	Cert	BS	MS	1st Prof	PhD	Totals	1981-1990
Medicine			46	5	1,031	11	1,093	2.0%
Osteopathic Medicine					94		94	-1.1%
Dental Medicine			39	30	331	4	404	-12.2%
Podiatric Medicine					128		128	-15.8%
Optometric Medicine			41		136		177	-2.7%
Chiropractic Medicine					202		202	-6.9%
Veterinary Medicine			70	15	84	9	178	0.0%
Pharmacy			1		126	4	131	-28.0%
Nursing	1,676		1,518	415		20	3,609	-2.7%
Allied Health	1,011	2,614	684	369		14	4,692	8.2%
Health Service Administration			284	222			506	295.3%
Public Health				84		10	94	-8.7%
Totals	2,667	2,614	2,683	1,140	2,132	72	11,308	4.5%
Change 1981 to 1990	-7.2%	23.8%	-4.6%	30.3%	1.1%	118.2%	4.5%	

Source: Fall Degrees Granted Surveys

Table B-3

PERCENT OF DEGREES AWARDED
TO BLACK AND HISPANIC STUDENTS
BY LEVEL AND HEALTH DISCIPLINE

	Black						Hispanic					
	1980-81		1986-87		1989-90		1980-81		1986-87		1989-90	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Certificate & Associate Programs												
Allied Health	na	na	517	15.4 %	672	18.5 %	na	na	78	2.5 %	104	2.8 %
Nursing	na	na	186	9.9	194	11.7	na	na	40	2.1	37	2.2
Baccalaureate Programs												
Allied Health	na	na	57	7.8	69	10.1	na	na	18	2.5	19	2.8
Nursing	na	na	137	7.6	178	11.7	na	na	25	1.3	39	2.5
Health Services Administration	na	na	45	17.1	72	25.3	na	na	8	3.0	14	4.9
Graduate Programs												
Allied Health	na	na	28	6.7	17	4.4	na	na	7	1.6	8	2.0
Nursing	na	na	14	3.8	25	3.7	na	na	5	1.3	6	1.3
Health Services Administration	na	na	12	5.8	10	4.5	na	na	0	0.0	5	2.2
Public Health	na	na	13	9.4	8	8.5	na	na	4	2.8	1	1.0
First Professional Degrees												
Medicine	47	4.4 %	48	4.8 %	45	4.4 %	24	2.2 %	48	4.8 %	55	5.3 %
Osteopathic Medicine	2	2.1	0	0.0	0	0.0	1	1.1	3	3.1	3	3.2
Dental Medicine	5	1.4	6	1.4	4	1.2	4	1.1	8	1.9	11	3.3
Podiatric Medicine	6	3.9	3	2.5	9	7.0	3	1.9	0	0.0	0	0.0
Optometry	1	0.7	1	0.8	2	1.5	0	0.0	6	4.7	5	3.7
Chiropractic Medicine	2	0.9	2	0.8	1	0.5	0	0.0	7	2.8	2	1.0
Veterinary Medicine	0	0.0	1	1.3	0	0.0	0	0.0	0	0.0	1	1.2
Pharmacy	0	0.0	1	3.4	8	6.3	0	0.0	0	0.0	2	1.6

Source: Fall Enrollment Surveys

Table B-4

PROJECTED JOB OPENINGS AND EMPLOYMENT CHANGE IN HEALTH OCCUPATIONS
AND DEGREES CONFERRED IN RELATED DISCIPLINES

<u>Occupational Title</u>	<u>Average Annual Job Openings</u>	<u>Employment Change 1988-2000¹</u>	<u>Degrees Conferred FY1990²</u>
Physician/Surgeons	689	13.3 %	1,125
Dentists	424	31.3	331
Podiatrists	122	6.1	128
Optometrists	108	34.2	136
Chiropractors	29	53.3	202
Veterinarians/Inspectors	59	15.4	84
Pharmacists	509	23.4	126
Registered Nurses	4,184	27.4	3,174
Health Service Managers	328	26.6	506
Public Health Workers	na	na	94
Allied Health	<u>10,673</u>		<u>4,692</u>
<u>Associate/Certificate Level</u>	<u>9,618</u>		<u>3,625</u>
Dental Hygienists	116	26.1 %	169
Dental Assistants	281	27.8	80
Dental Lab Technicians	93	5.0	30
Cardiology Technicians	12	10.6	7
EKG Technicians	11	-3.5	-
EEG Technicians	28	44.5	-
Emergency Medical Technicians	170	22.2	274
Respiratory Therapists	75	25.5	150
Radiologic Technologists/Technicians	204	26.0	261
Surgical Technicians	92	15.9	25
Home Health Aides	1,260	85.1	2
Pharmacy Assistants	186	21.1	40
Medical Assistants	279	39.3	96
Veterinarian Technicians	18	21.3	22
Physician Assistants	60	10.7	10
Nursing/Psych. Aides	3,406	29.1	1,137
Licensed Practical Nurses	1,656	29.8	747
Opticians	333	35.9	12
Occupational Therapy Assistants	47	35.9	52
Physical Therapy Assistants	177	35.4	111
Medical Lab Technicians	81	1.0	84
Medical Records Technician/Technologist	171	48.3	122
Other Allied Health Professionals	862		194
<u>Baccalaureate and Graduate Level</u>	<u>1,055</u>		<u>1,067</u>
Speech Pathologist/Audiologists	105	23.6 %	186
Clinical Lab Technologists	238	18.5	124
Occupational Therapists	90	47.8	73
Physical Therapists	246	49.0	159
Recreational Therapists	62	32.4	7
Other Allied Health Professionals	314		518

¹Source: Occupational Projections: State of Illinois 1988-2000, Department of Employment Security (Compiled from occupational projections for individual hospital areas which differ from statewide projections.)

²Source: Fall Degrees Conferred Survey

Table B-5

EXPENDITURES FOR HEALTH PROFESSIONS GRANTS
STATE APPROPRIATED FUNDS

(in thousands of dollars)

Grant Type	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	Percent Change 1980-90
Illinois Board of Higher Education												
Health Service Education Grants												
Medicine	\$8,225	\$8,764	\$8,764	\$8,188	\$8,845	\$8,913	\$8,879	\$8,649	\$8,300	\$8,309	\$9,584	16.5 %
Medical Training Clinicals	283	323	366	358	0	0	0	0	0	0	0	(100.0)
Residencies	1,126	1,452	1,458	1,429	1,471	1,501	1,758	2,513	1,631	1,612	1,638	45.5
Dentistry	1,550	1,813	1,886	1,848	1,952	1,972	1,816	1,691	1,428	1,336	1,254	(19.1)
Podiatry	343	374	358	332	324	338	314	290	288	254	228	(33.5)
Optometry	293	266	274	262	274	274	274	266	263	318	435	71.9
Nursing	2,337	2,671	2,832	3,043	3,240	3,093	2,914	2,768	2,508	2,299	2,204	(5.7)
Allied Health Programs	1,043	266	1,023	953	941	922	923	840	824	804	827	(20.7)
Total IBHE	<u>15,160</u>	<u>15,929</u>	<u>16,961</u>	<u>16,413</u>	<u>17,047</u>	<u>17,013</u>	<u>16,878</u>	<u>17,017</u>	<u>15,242</u>	<u>14,932</u>	<u>16,170</u>	6.7 %
Illinois Department of Public Health												
Family Practice Programs	925	0	0	0	0	700	700	686	685	686	686	(25.8)
Medical Scholarships	200	315	255	114	24	999	1,998	2,839	2,777	2,283	2,683	1241.5
Dental Scholarships	35	98	112	58	10	0	0	0	Act Repealed			(100.0)
Baccalaureate Nursing Scholarships	0	0	0	0	0	205	447	545	392	378	550	-
Total IDPH	<u>1,160</u>	<u>413</u>	<u>367</u>	<u>172</u>	<u>34</u>	<u>1,904</u>	<u>3,145</u>	<u>4,070</u>	<u>3,854</u>	<u>3,347</u>	<u>3,919</u>	237.8
TOTAL ALL GRANTS	<u>\$16,320</u>	<u>\$16,342</u>	<u>\$17,328</u>	<u>\$16,585</u>	<u>\$17,081</u>	<u>\$18,917</u>	<u>\$20,023</u>	<u>\$21,087</u>	<u>\$19,096</u>	<u>\$18,279</u>	<u>\$20,089</u>	23.1 %

Source: 1980-1990 Illinois Annual Reports

Table B-6

**ILLINOIS PUBLIC UNIVERSITIES' FISCAL YEAR 1990 EXPENDITURES FROM STATE APPROPRIATED
FUNDS FOR INSTRUCTION, RESEARCH, PUBLIC SERVICE, AND SUPPORT
IN THE HEALTH PROFESSIONS**

(in thousands of dollars)

	Direct and Indirect Instruction	Research	Public Service	Department and School Overheads	Institutional Support Functions ¹	Total
Units Included in the Discipline Cost Study	\$ 15,619.6	\$ 8,091.5	\$ 3,659.3	\$ 35,291.1	\$ 34,030.7	\$ 96,692.2
Dental Auxiliaries	317.9	13.9	31.4	180.4	366.5	910.1
Diagnostic And Treatment Services	175.7	4.4	9.6	108.6	216.9	515.2
Medical Laboratory Technologies	38.4	1.6	22.9	42.5	79.0	184.4
Mental Health/Human Services	212.6	37.1	143.3	235.0	582.3	1,210.3
Miscellaneous Allied Health Services	92.1	159.1	74.6	118.7	216.0	660.5
Rehabilitation Services	979.2	326.9	452.9	1,760.6	2,285.3	5,804.9
Other Allied Health	58.7	16.8	35.4	42.7	106.2	259.8
Audiology And Speech Pathology	2,016.4	451.9	664.0	1,358.5	2,968.0	7,458.8
Health Services Administration	728.6	139.6	94.5	750.9	1,273.1	2,986.7
Medical Laboratory	458.7	86.0	53.9	649.0	771.6	2,019.2
Nursing	4,878.0	1,164.7	642.0	5,395.8	7,027.9	19,108.4
Pharmacy	1,153.1	1,630.2	211.6	2,999.3	3,311.9	9,306.1
Public Health	825.6	938.0	250.0	2,643.7	2,356.8	7,014.1
Veterinary Medicine	3,104.2	3,091.7	852.3	5,374.9	5,545.5	17,968.6
Other Health Sciences ²	580.4	29.6	120.9	13,630.5	6,923.7	21,285.1
Units Outside the Discipline Cost Study						\$ 191,534.9
Southern Illinois University at Carbondale Medical Programs						30,002.2
Southern Illinois University at Edwardsville Dental Medicine Programs						6,898.5
University of Illinois at Chicago Medical Programs						78,721.1
University of Illinois at Chicago Dental Medicine Programs						12,794.8
University of Illinois Hospital						63,118.3
TOTAL						\$ 288,227.1

¹ Includes Academic Support, Student Services, Institutional Support, Independent Operations, and O & M of Physical Plant.² Includes departmental support for Division of Services to Crippled Children at the University of Illinois at Chicago.

Source: Fiscal Year 1990 Public University Discipline Cost Study and Reconciliation Forms